Abstract

The invention relates to membrane-electrode assemblies for the electrolysis of water (electrolysis MEAs), which contain an ion-conducting membrane having a front and rear side; a first catalyst layer on the front side; a first gas diffusion layer on the front side; a second catalyst layer on the rear side, and a second gas diffusion layer on the rear side.

The first gas diffusion layer has smaller planar dimensions than the ion-conducting membrane, whereas the second gas diffusion layer has essentially the same planar dimensions as the ion-conducting membrane ("semi-coextensive design"). The MEAs also comprise an unsupported free membrane surface that yields improved adhesion properties of the sealing material. The invention also relates to a method for producing the MEA products.

Pressure-resistant, gastight and cost-effective membrane-electrode assemblies are obtained, that are used in PEM water electrolyzers, regenerative fuel cells or in other electrochemical devices.